Inc. (MMCG), an independent firm based in Santa Barbara, California, to develop and implement this Marine Mammal Mitigation Plan.

This plan provides a brief description of the structure to be removed and the method proposed to remove it, as well as the procedures that will be used to install the new roosting platforms. The plan relates potential impacts to marine wildlife from the removal and installation activities. It summarizes regulations pertaining to the protection of marine wildlife, then describes the species most likely to be encountered at or near the project site. The plan then discusses in detail the steps that will be taken to reduce potential impacts to minimal levels. A literature cited section is included to indicate the sources of various facts cited in the text. An appendix includes tables that outline the seasonality and likelihood of occurrence of all marine mammal and sea turtle species reported in the region. A second appendix provides information on the dynamics of underwater sounds from explosions and pile driving and how this information was applied to this mitigation plan.

3.0 BACKGROUND

3.1 The Remnant Structure at PRC-421

A total of eight columns make up the supports for the topside structure at PRC-421. Each column is about 8 feet in diameter and 50 feet tall. Since the water depth at the site is about 32 feet at mean lower low water, the amount of column out of the water is about 18 feet. The columns are arranged in three rows, each of which extends in a southeast-northwest direction. The first row, designated A-1 through A-3, is on the shoreward or north side, with A-1 on the west end, A-2 in the middle, and A-3 on the east end. The next row, called B-1 through B-3, is in the middle, while the last row, named C-1 and C-2, is on the ocean or south side. Column C-1 lines up with columns B-2 and A-2, however, while C-2 lines up with A-3 and B-3. Together, the eight columns form a thick "L" shape about 60 feet by 60 feet (ARCO 1999 and 2003).

The columns at PRC-421 were constructed by placing a framework of steel rebar around each set of H-piles, then lowering a cylindrical form over the framework. This form extended to the sand on the sea floor rather than to bedrock. Concrete was then poured into the form and allowed to harden (Lorentz, pers. comm.).

3.2 Explanation of the Removal Process

A barge serving as a crane support and dive center, and a crew boat, will be deployed to the site and anchored with a four-point mooring. The uppermost structure will then be cut off and removed. Next, divers will remove debris around the columns, then cut the single well conductor below the mudline. All salvaged material will be properly disposed of ashore. Sediments will be removed from the base of the columns with a water jet to expose the four H-piles under each column (ARCO 1999 and 2003).

Explosives have been selected as the safest means of severing the H-piles. As mentioned in the Introduction, the columns are in danger of collapse and one column is already partially gone. Having divers place a mechanical cutting device under severely weakened structures to sever the remaining supports—the H-piles—one at a time is too dangerous.

Once the H-piles have been exposed, the demolition contractor will begin lowering linear shaped charges to a diver. Each one of these charges will weigh approximately 1.8 pounds and will be composed of RDX (Cyclonite: cyclotrimethylene trinitramine: hexagen). One charge will be placed around each of the four exposed H-piles under each column, for a total weight about 7.2 pounds per column, or approximately 57.6 pounds total for all eight columns (ARCO 1999 and 2003). The total number of charges will be 32.

The four charges under each column will be detonated in pairs a fraction of a second apart. First, two of the charges will be detonated at lower points on the H-piles, followed by the remaining two charges (ARCO 1999). This will help topple the columns in the desired pattern. Each set of charges under all eight columns will be detonated in rapid succession. The charges will be shaped so they detonate inwards, severing each H-pile cleanly and avoiding significant damage to the columns, which will form the base of the artificial reef.

The toppled columns will then be nested together. This will involve placing a sling around one end of a column and swinging it over next to an adjacent column until all the columns are nested as closely together as is practicable (ARCO 2003).

Next, divers will remove the remnants of the pier pilings with cutting torches. Pilings will be cut at or below the mudline. A second nearshore well conductor will be removed approximately one foot below the mudline. The rocks will be left in place as additional hard bottom habitat. All debris items located in a recent bathymetric survey (Fugro 1999) will be located, documented and removed (ARCO 1999).

The four piles for the new pelican roosting habitat will be driven to design depth into the bedrock, then the roosting platforms will be installed. Lorentz (pers. comm.) estimated that pile driving would require two to four days. After the piles are driven, divers will jet a 30-inch diameter pipe into the seabed around the stub of the well conductor to allow future access to the conductor. Quarry rock will then be pushed off a barge with a loader to cover the columns. Once the rock has been placed, the 30-inch pipe surrounding the well conductor will be trimmed level with the top of the rock (ARCO 2003).

3.3 Regulations Applicable to Marine Wildlife Protection

Most marine mammals and all sea turtles fall under the jurisdiction of National Oceanic and Atmospheric Administration (NOAA) Fisheries (formerly National Marine Fisheries Service or NMFS), U.S. Department of Commerce, although all marine mammals within California waters remain state property, thus they are also under the jurisdiction of CDFG. The only species of marine mammal in this region not under the jurisdiction of NOAA Fisheries is the sea otter, which is under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS), Department of the Interior.

Under the Marine Mammal Protection Act of 1972 (MMPA) and various amendments, all marine mammals are protected. It is illegal to "take" any marine mammal. Take is defined as "to harass, hunt, capture, or kill any marine mammal." In 1994 amendments, harassment was divided into two levels. Level A harassment meant "any act of pursuit, torment or annoyance which had the potential to injure a marine mammal or a marine mammal stock in the wild." Level B harassment meant any act that had "the potential to

disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering" (MMPA 1972, amended 1994, 16 U.S.C., § 1431 *et seq.*).

Several stocks of endangered whales are considered strategic under the MMPA (Carretta *et al.* 2001). Strategic refers to a stock of whales that is being negatively impacted by human activities and may not be sustainable, thus it is of strategic importance at a regional or population level. Also, some species are considered depleted when the population falls below optimum sustainable levels.

Some marine mammals and all sea turtles are listed in the federal Endangered Species Act of 1973 (ESA). A few species of seabirds, which are under the jurisdiction of the USFWS, also are protected by the ESA. Under this act, animals can be listed as threatened, which means likely to become endangered in the foreseeable future, or endangered, which means likely to become extinct over all or a significant part of its range. Also, some species may be proposed as candidates for listing as either threatened or endangered under the act. Threatened species can be shifted to endangered status if necessary, while endangered species can be downlisted to threatened status or removed from the Endangered Species List entirely. Threatened species can also be delisted. The State of California also has an Endangered Species Act similar to the federal ESA. In some cases, the same species may be listed under both acts.

No critical habitat under ESA has been established for any of the threatened and endangered marine mammal and sea turtle species in Southern California, thus no critical habitat for these species would be affected by project activities. Critical Habitat for the western snowy plover *(Charadrius alexandrinus nivosus)* includes Devereaux Beach, west of Coal Oil Point and approximately two miles (three km) east of the project site (USFWS 2001; MMS 2001).

Most sea birds are protected under the federal Migratory Bird Treaty Act, which is enforced by the USFWS. In addition, some species are also protected under California law. Finally, a few species are classified as California Species of Special Concern.

3.4 Potential Impacts of Project Activities

3.4.1 Collisions

Collisions (ship strikes) between vessels and marine mammals and sea turtles have been documented throughout California waters (Carretta *et al.* 2001 and 2002; NMFS and USFWS 1998a-d; Cordaro, pers. comm.). Ships rather than small craft are most often involved in collisions with whales. The bows of such vessels have a bulbous protuberance designed to virtually eliminate the bow wake. Consequently, most of the noise associated with such vessels is toward the stern, where the machinery and propeller are located. With some ships as much as 1200 feet long, this suggests that the noise from an approaching vessel may not be perceived as a threat in time, particularly considering that most modern ships can cruise at over 20 knots. Collisions between smaller craft and whales, pinnipeds, dolphins, and sea otters also occur occasionally. Although a collision between a project vessel and a marine mammal is possible, it is unlikely because no collisions between oil industry vessels and marine mammals have been reported (Cordaro, pers. comm.).

3.4.2 Acoustic Impacts

Anthropogenic noise in the world's oceans is of increasing concern to the regulatory agencies and to NOAA Fisheries in particular (Carretta *et al.* 2001). Marine mammals rely upon hearing to communicate and to detect predators and prey. Odontocetes (toothed whales, dolphins and porpoises) also rely upon sound for echolocation. Anything that affects the ability of marine mammals to hear, including noise that masks other sounds, can be life-threatening. Birds are less reliant on hearing for survival, instead relying primarily on vision.

Underwater detonations and pile driving operations send sound waves through the water that can harass, injure or kill marine wildlife. Animals with air- or gas-filled cavities in their bodies, including marine mammals, diving sea birds, sea turtles, and most bony fish are particularly vulnerable because the cavities are subject to rapid compression and decompression as sound waves pass through them.

The most pervasive sounds from detonations or pile driving operations are at low frequencies. Sound frequencies are measured in hertz (Hz) and kilohertz (kHz). One hertz equals one cycle per second, which is an extremely low frequency. One kilohertz equals 1000 hertz. Detonations in deep water generally peak at about 15 Hz (Richardson *et al.* 1995), while shallow water detonations can range up to a few hundred hertz. Pile driving sounds are dominant from 20 to 800 Hz (Richardson *et al.* 1995; Wursig *et al.* 2000).

Certain baleen whales, which strain their food from the sea with their brushlike baleen plates, can emit vocalizations as low as 20 Hz, which presumably they can hear. Some researchers believe that baleen whales can hear sounds as low as 12 Hz. Richardson *et al.* (1995) believe that some baleen whales can detect sounds as low as 5 Hz. Baleen whales also are known to react to sounds as high as 28 kHz. Thus if sound produced by a detonation or a pile driving operation were sufficiently loud, it could be detected by a baleen whale, perhaps resulting in Level B harassment of the whale if a startle response were noted.

Most small odontocete cetaceans (toothed whales, dolphins and porpoises) are sensitive to sounds above 10 kHz, but some species can detect sounds as low as 1 kHz. The upper level of their hearing sensitivities ranges from 65 kHz to well over 100 kHz. Thus it is likely that unless such a creature were close to a detonation or pile driving operation, it would not hear it and thus would not be harassed by it. If an animal were extremely close to such a sound, it could detect the noise if it were sufficiently intense, or it could be injured by the sound pressure wave if it were sufficiently strong.

Harbor seals *(Phoca vitulina richardsi)*, which are common in the project area, normally hear in the range of 1 to 60 kHz, but they can detect sounds as low as 100 Hz and as high as 180 kHz (Terhune 1988). Thus they could be harassed by sound if the sound were sufficiently loud. Harbor seals do not hear as well out of water.

Eared seals, which include the California sea lions *(Zalophus californianus c.)* that are found in the project area, generally hear frequencies from 2 kHz to 36 to 40 kHz, although they can detect sounds as low as 100 Hz (Schusterman 1981). Thus, they could also be harassed by sounds of a detonation or pile driving operation if they were close enough. Like harbor seals, sea lions do not hear sounds as well out of the water.